

REMARKS

Applicants thank the Examiner for the thorough Examination of the application. The specification has been amended to improve its language and clarity. No new matter is believed to be added to the application by this Amendment.

Statement Of Substance Of Interview

Applicants thank the Examiner for graciously conducting a personal interview with the Applicants' representative on September 23, 2005. During the interview, the subject matter of the invention was discussed, and potential amendments to the specification and claims to clarify the present invention were evaluated.

At the end of the interview the Examiner prepared an Interview Summary. The Interview Summary has been reviewed, and it appears to have accurately described the substance of the interview.

Status Of The Claims

Claims 2-23 are pending in the Application. Claims 5, 6, 9, 10, 11, 20 and 21 are withdrawn. Claim 1 is cancelled. The claims have been amended to improve their language and to better set forth the invention being claimed. Support for claim 23 can be found in the paragraph starting at page 13, line 23 of the specification.

Objection To The Specification

The specification is objected to as not being written in full, clear and concise terms.

In paragraph 3 of the Office Action, the Examiner asserts that the term "liquid catalyst" is erroneous and misleading. However, this term has already been amended to recited the more clear "sulfur-capturing liquid" in the Substitute Specification filed concurrently with the Amendment of October 27, 2004. Additionally, the drawings (Figures 1A, 1B and 2) are being amended to change the words "liquid catalyst" to "sulfur capturing liquid."

Also, the Examiner points out that silver acetate is precipitated from the mixture of silver nitrate and sodium acetate only under certain conditions, i.e., when a concentrated solution of either silver ion or acetate ion is added to the mixture. In order to obtain a pure sulfur capturing liquid containing silver nitrate and sodium acetate for X-ray analysis of the concentration of sulfur in the oil sample of the present invention, a silver nitrate solution is first mixed with a sodium acetate solution. If precipitate containing silver acetate generates unintentionally, this precipitate must be removed by filtration from the solution. There is no intent to make silver acetate precipitate quantitatively in the present invention. As a result, the paragraph bridging pages 2 and 3 of the specification has been amended to better explain this aspect of the present invention.

The Examiner further questions how irradiating the solution with electromagnetic waves or X-rays cause precipitation of sulfide-containing silver compounds and silver, if

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there is no metallic silver or sulfur in the solution. As discussed above, the sulfur capturing liquid contains silver nitrate because only silver acetate generated unintentionally is removed from solution. As described at page 3, line 1 of the substitute specification ("S contained in such a commercial reagent cannot be neglected"), a silver nitrate solution and/or a sodium acetate solution might contain sulfur as an impurity. If so, sulfur has to be removed from the solution.

That is, two alcohol solutions (silver nitrate and sodium acetate) are prepared and then the two alcoholic solutions are combined to prepare a sulfur capturing liquid. The limited solubility of silver acetate in an alcoholic solution would cause a certain amount (but not all) of silver acetate to precipitate. Then, the sulfur capturing liquid is radiated with X-rays so that residual sulfur and impurities in the solution precipitate and can be removed so as to yield a completely sulfur-free sulfur captioning liquid for subsequent use.

In regards to the mechanism of X-ray radiation, various organic sulfur compounds are contained in petroleum products and solvents as impurities, as is described at page 1 of the substitute specification. If X-rays irradiate on such products or solvents, organic sulfur compounds decompose and then sulfur in the organic compounds reacts with silver in the sulfur capturing liquid to form precipitates. In this reaction, it was not confirmed experimentally whether metallic silver was contained in the precipitate. As the decomposition caused by X-ray irradiation is very complex, it is very difficult to identify all compounds created by the decomposition. The specification broadly discloses "silver sulfide containing silver compounds and silver," although X-

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rays itself would not have the function to reduce Ag cation to Ag metal. In light of this, the claims have been amended to recite "precipitates containing silver sulfide" instead of "silver sulfide containing silver compounds and/or silver."

The above comments also apply to the rejections, which are traversed and discussed below.

The specification is thus written in such full, clear, concise and exact terms to enable one having ordinary skill in the art to practice the invention in its best mode.

Rejection Under 35 U.S.C. §112, First Paragraph

Claims 22, 2-4, 7-8, and 12-19 have been rejected by the Examiner under 35 USC §112, first paragraph, as not being enabled by the specification. Applicants traverse.

At paragraph 5, of the Office Action, the Examiner asserts that the claims are enabled by a solvent comprising sulfur but is not enabled for a solvent not containing sulfur. However, as discussed above, sulfur is not a solvent but is present as an impurity. That is, at least one of the silver nitrate solution and the silver acetate solution must contain sulfur. Page 3, line 1 of the specification discusses that sulfur contained in a commercial reagent cannot be ignored. An object of the invention is to thus remove sulfur from the reagent/solvent mixture so as to allow its use to remove and measure sulfur content without inaccuracies being introduced by the presence of this residual sulfur impurity. As set forth in instant claim 22, "at least one of the silver nitrate solution or sodium nitrate solution may contain sulfur compounds." Also, as set forth in instant

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claim 23, the solvent is a water/alcohol mixture. However, in order to use the reagent/solvent mixture as a sulfur-capturing liquid, the sulfur impurities present in the commercial solvents and reagents must be removed.

Also, the Examiner asserts that the mechanism of precipitating silver acetate using X-ray irradiation is unclear. However, as discussed above, the decomposition caused by X-ray irradiation is complex. However, this mechanistic complexity is no barrier to one of ordinary skill practicing the invention without undue experimentation.

The claims are thus fully enabled by the specification. This rejection is overcome and withdrawal thereof is respectfully requested.

Rejection Under 35 U.S.C. §112, Second Paragraph

Claims 22, 2-4, 7-8, and 12-19 have been rejected by the Examiner under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regards as the invention. Applicants traverse.

At paragraph 7 of the Office Action, the Examiner infers that claim 22 is apparently a product-by-process claim. Claim 22 has been amended to clearly set forth the process steps by which the product is obtained.

Also, the Examiner asserts that the presence of sulfur and removal of precipitates is unclear. However, as discussed above, sulfur is present as an impurity, unintentionally precipitated silver acetate is removed and silver-containing precipitates are removed. Therefore, claim 22 has been amended to recite "at least one of the silver

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nitrate solution or sodium nitrate solution may contain sulfur compounds.” Claim 22 has also been amended to recite “removing silver acetate precipitated from the mixed solution if precipitate generates” and “removing any precipitation, which can include silver sulfide.” Claim 22 has thus been amended to clarify the relation between silver, sulfur and precipitates.

Also, the Examiner asserts that claims 2, 4, 8, 13, 15 and 18 are unclear as to why sulfur is present in solution if the solvent is a C₁₋₁₈ alcohol. However, these claims have been amended to show that sulfur may be present as an impurity in the alcohol.

The Examiner further asserts that the relationships between the steps in claims 3 and 22 are unclear. Claim 3 has therefore been rewritten to stand as an independent claim so as to eliminate any potential confusion between claim 3 and claim 22.

Claim 7 has also been amended to clarify the sulfur compounds by reciting “sulfur compounds including silver sulfide.” Claim 14 has been amended to clarify making precipitates including silver sulfide. The claims have additionally been amended to clearly set forth that the invention pertains to a sulfur capturing liquid.

The claims, as amended, are thus clear, definite and have full antecedent basis. This rejection is overcome and withdrawal thereof is respectfully requested.

Information Disclosure Statement

The Examiner is thanked for considering the Information Disclosure Statement filed March 24, 2005, and for making the initialed PTO-1449 form of record in the

application in the Office Action mailed July 11, 2005. However, the Examiner has not initialed Ayukawa, p.53, November 9, 2001.

Prior Art

The prior art cited but not utilized by the Examiner indicates the status of the conventional art that the invention supercedes. Additional remarks are accordingly not necessary.

Foreign Priority

The Examiner has acknowledged foreign priority and indicated that the certified copies of the priority documents have been received in the Office Action mailed July 11, 2005.

Conclusion

The Examiner's rejections have been overcome, obviated or rendered moot. No issues remain. The Examiner is accordingly respectfully requested to place the application in condition for allowance and to issue a Notice of Allowability.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert E. Goozner, Ph.D. (Reg. No.42,593) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Application No. 10/099,953
Amendment dated November 14, 2005
Reply to Office Action mailed July 11, 2005

Docket No.: 1517-0138P

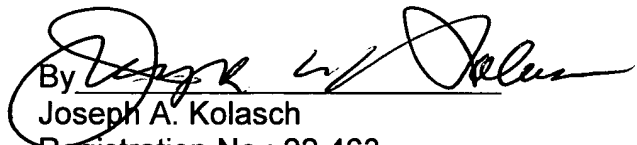
Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), Applicant(s) respectfully petition(s) for a one (1) month extension of time for filing a reply in connection with the present application, and the required fee of \$120.00 is attached hereto.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Dated: November 14, 2005
(Mon. after Federal Holiday)



Respectfully submitted,



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AMENDMENTS TO THE DRAWINGS

Please amend the drawings is indicated in the marked-up drawing figures.
Formally amended drawing figures will follow.